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Pricing in transport; a multimodal perspective. An introduction

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Setting the scene: efficiency and marginal social cost based pricing

Pricing plays a major role in transport policies in many countries. The well-known motivations of pricing policies are the promotion of efficiency and equity. Efficiency leads to the rule that prices are based on marginal social costs implying that the marginal benefits of transport activities equal the marginal social costs. These social costs usually depend on four elements:

1. costs related to time devoted to transport,
2. costs of inputs acquired via the private market (for example with car use),
3. costs related to the services rendered by the public sector (for example most of infrastructure) and
4. external costs imposed on others (pollution, congestion).

There are several main problems related to the application of marginal cost based pricing (see for a discussion also Verhoef, 1996, Rothengatter, 2003 and Nash 2003). Below we give a short description.

Measurement difficulties

The measurement of some cost components mentioned above is not straightforward. In particular the valuation of external costs of transport is a field where still many uncertainties exist. In a number of fields such as transport safety and noise, considerable progress has been made during the past decades, but in other fields, such as the appropriate valuation of CO_2 emissions, and the intrusion effects of transport there is still much uncertainty.

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Financing problems

The use of marginal costs as a principle for pricing may well lead to financing problems for the public sector. For example, most transport infrastructures are uncongested, implying that charging users for the marginal costs would not be sufficient to cover the total costs. Hence other sources of finance would be needed.

Imperfections in other markets

Given the key role of transport as a link between economic sectors and also given the interdependencies between transport sectors, the simple use of marginal cost pricing in a transport sector is not necessarily efficient. For example, charging one transport mode for NOx emissions, while ignoring emissions in other modes may lead to a modal shift so that only a small part of the potential welfare gain is achieved. This is an example of market imperfections. These imperfections call for second best pricing strategies where behavioural responses in imperfect markets are anticipated. This obviously adds to the complexity of pricing strategies, since no longer is it sufficient that the marginal costs should be correctly estimated for one particular transport mode, but also the marginal costs in other transport modes should be estimated, and on top of that also the effects of pricing measures on modal shift should be considered.

Implementation costs

Implementation costs of marginal social cost pricing may be high. This depends strongly on the type of cost considered. For example, fuel taxes are easy to implement and are an appropriate tool to address CO_2 emissions. But on the other hand, congestion based charging strategies may lead to rather expensive charging systems. The good news is that with the present trends in information and communication technologies the prospects for cost reductions are favourable.

Equity problems

Another problem with marginal social cost pricing would be that it may lead to equity problems. For example, when charging passengers the full social costs of transport this may reinforce problems of social exclusion. Important specific groups that are often considered concern the poor, and the physically handicapped. A broader discussion of equity is given below.

Equity problems and pricing in transport

As shown above, equity problems may be an unintended side effect of efficiency oriented policies to address transport problems such as congestion and environmental nuisance. A broader perspective is that equity may be the explicit aim of certain

transport policies such as the construction of infrastructure in lagging regions. In this case, equity is more than a side effect: it is the main motivation for a certain transport policy.

As noted for example by Viegas (2001) and Rietveld (2003) the notion of equity is not unambiguous, however. Equity concepts that arise in the literature and in political debates are:

1. *Horizontal equity.* Comparable individuals should be treated in a comparable way.
2. *Territorial equity.* This results from the notion of individual equity when it is projected on relatively homogeneous regions. For example, comparable regions need to get similar funds for public transport.
3. *Level playing field.* Transport sectors should be treated in similar ways according to taxation, payment for the use of infrastructure, etc.
4. *Vertical equity.* This means that disadvantaged individuals deserve protection. People should be burdened according to their ability to contribute, and this may lead to schemes where taxes are more than proportional with income.
5. *Transport users should pay their way.* As indicated by Gomez Ibanez (1997) this concept is usually interpreted in terms of average costs implying that the collective of all transport users exactly pays for the aggregate costs.
6. *Individuals that are negatively affected by policies need to be compensated.* This principle takes its starting point in the status-quo and says that winners have to compensate losers.

This list of interpretations of the equity notion makes clear that it can be used in various ways by various interest groups. Hence, there is not only a potential conflict between efficiency and equity, but also between various equity interpretations. Consider for example a tax increase in a certain transport sector in order to reach level playing field conditions (equity concept 3). Such a policy may be opposed by the companies in this particular sector because of the abovementioned status quo arguments (equity concept 7).

An important reason why equity considerations are important is that ignoring them may have serious acceptability implications. In democratic societies these implications may have a strong impact on the political feasibility of policies. They are among the main reasons why pricing is a difficult domain in the practice of transport policy making.

Introduction to papers

The present collection of papers in this special issue on pricing strategies in transport is in the heart of these debates between efficiency and equity. It is a selection of papers that were presented at the NECTAR Euroconference that took place in June 2005 in Las Palmas. An attractive feature of this collection is the multimodal perspective adopted. Three of them concern road pricing issues (Allen et al., Ieromonachu et al. and Ubbels and Verhoef), two concern pricing in public transport (Macharis et al., Goeverden et

al.), and one is on pricing related to noise near airports (Martin and Betancor). This multimodal perspective is important for at least three reasons. First, a tendency can be observed that policy makers treat various transport modes in very different ways, that may be explained by historical reasons, but that are difficult to defend on efficiency grounds. This comes close to the grandfathering theme. Examples are the very different treatments of air, water and land transport from the viewpoint of pricing policies. A multimodal perspective helps to avoid biases in transport policies. Second, a multimodal perspective will stimulate learning processes. For example, insights obtained in the domain of airports may be transferable to that of seaports. And third, in line with what is said above on second best pricing, interrelationships between transport modes should be considered.

A second feature of the present collection of papers is the balanced attention that is paid to both equity and efficiency considerations. Efficiency effects are prominent in the contributions of Martin and Betancor, Goeverden et al., and Macharis et al.). On the other hand the three road pricing oriented contributions (Allen et al., Ieromonachu et al. and Ubbels and Verhoef) focus on equity and acceptability aspects. An interesting observation is that it is road oriented studies that focus on equity and acceptability. This may reveal the state of affairs in research and policy making. In the road sector researchers have for a very long time been exploring the efficiency implications of pricing policies. The major bottleneck nowadays seems to concern equity and acceptability. This is a nice illustration that a balanced treatment of both concerns is needed in research and policy in order to make further progress on this fascinating field of transport pricing.

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